WHAT IS CLAIMED IS:

1. A digital subscriber line communicating system for communicating between a transmitting side and a receiving side through a communication line, comprising:

a sliding window generating unit for generating a sliding window based on a timing signal representing a periodical noise duration; and

a sliding window transmitting unit for transmitting modulated symbol according to said sliding window through said communication line to said receiving side;

said sliding window generating unit comprising:

a hyperframe counter for periodically counting a predetermined number of continuous transmitting modulated symbols constituting a hyperframe synchronized with said timing signal; and

a decoder for discriminating, based on the count value output from said hyperframe counter, whether a transmitting data symbol belongs to a far end cross-talk duration at said receiving side or a near end cross-talk duration at said receiving side.

2. The digital subscriber line communicating system according to claim 1, wherein said hyperframe counter is reset each time when said hyperframe counter counts said predetermined number of continuous transmitting data symbols.

3. The digital subscriber line communicating system according to claim 1, wherein said transmitting side is a central office and said receiving side is a remote terminal;

said central office comprising:

a timing signal generating unit for generating said timing signal synchronized with a periodical noise including said periodical noise duration which interferes with said central office and said remote terminal;

a receiver equalizer; and

a sequencer for effecting a transition of the status of initialization of said central office during an initialization period before starting usual communication, said initialization period including an activation and acknowledgement sequence, a transceiver training sequence for performing an initial training of said receiver equalizer, a channel analysis sequence for measuring the quality of said communication line, and an exchange sequence for determining the transmitting capacity of said communication line based on the measured quality of said communication line.

4. The digital subscriber line communicating system according to claim 3, wherein, said sequencer effects the transition of the status based on the value counted by said hyperframe counter.

5. The digital subscriber line communicating system according to claim 3, wherein, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence, said initialization is carried out by transmitting modulated symbols through only the inside of said sliding window.

6. The digital subscriber line communicating system according to claim 3, wherein, during said transceiver training sequence said exchange sequence, and said channel analysis sequence except for a quality measuring sequence, said initialization is carried out by transmitting modulated symbols through only the inside of said sliding window, and during said quality measuring sequence in said channel analysis sequence, said initialization is carried out by transmitting modulated symbols through both the inside and the outside of said sliding window.

7. The digital subscriber line communicating system according to claim 3, further comprising:

a sequence transition determining unit for making a transition, in synchronization with said timing

signal, from said activation and acknowledge sequence to said transceiver training sequence or from said transceiver training sequence to said channel analysis sequence.

8. The digital subscriber line communicating system according to claim 1, wherein said transmitting side is a remote terminal and said receiving side is a central office;

said remote terminal comprising:

a timing signal generating unit for generating said timing signal synchronized with a periodical noise including said periodical noise duration which interferes with said remote terminal and said central office;

a receiver equalizer; and

a sequencer for effecting a transition of the status of initialization of the status of said remote terminal during an initialization period before starting usual communication, said initialization period including an activation and acknowledgement sequence, a transceiver training sequence for performing an initial training of said receiver equalizer, a channel analysis sequence for measuring the quality of said communication line, and an exchange sequence for determining the transmitting capacity of said communication line based on the measured quality of said communication line.

9. The digital subscriber line communicating system according to claim 8, said sequencer effects the transition of the status based on the value counted by said hyperframe counter.

10. The digital subscriber line communicating system according to claim 8, wherein, according to a single bitmap mode, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence, said initialization is carried out by transmitting modulated symbols through only the inside of said sliding window.

11. The digital subscriber line communicating system according to claim 8, wherein, according to a dual bitmap mode, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence except for a quality measuring sequence, said initialization is carried out by transmitting modulated symbols through only the inside of sliding window, and during said quality measuring sequence in said channel analysis sequence, said initialization is carried out by transmitting modulated symbols through both the inside and the outside of sliding window.

12. The digital subscriber line communicating system according to claim 8, further comprising:

a sequence transition determining unit for making a transition, in synchronization with said timing signal, from said activation and acknowledgement sequence to said transceiver training sequence or from said transceiver training sequence to said channel analysis sequence.

13. The digital subscriber line communicating system according to claim 3 ~~or 8~~, wherein, according to a dual bitmap mode, said modulated symbols are transmitted from said transmitting side through both the inside and the outside of said sliding window, and said modulated symbols are used for training of said receiver equalizer by said receiving side only when said receiving side is in a far end cross-talk duration.

14. The digital subscriber line communicating system according to claim 3 ~~or 8~~, wherein, according to said dual bitmap mode, during the training of said receiver equalizer in said transceiver training sequence, a step size for updating coefficients of said receiver equalizer is made to be zero in said near end cross-talk duration, or to be a value smaller than the value in said far end cross-talk duration in said near end cross-talk duration at said receiving side, so that said transceiver training sequence is carried out continuously in said far

end cross-talk duration and said near end cross-talk duration at said receiving side.

15. The digital subscriber line communicating system according to claim 3 ~~or 8~~, wherein said receiving side comprises:

a synchronization symbol detecting unit for detecting a synchronization symbol included in each of superframes which constitute said hyperframe;

an inverse synchronization symbol detecting unit for detecting an inverse synchronization symbol included in said hyperframe; and

an inverting unit for rotating the phase of each carrier signal of the detected inverse synchronization symbol, except for the carrier signal of a pilot tone, by substantially 180° to obtain an inverted inverse synchronization symbol having the same phase as the phase of each of the detected synchronization symbols;

the detected synchronization symbols and the inverted inverse synchronization symbol being used for the training of said receiver equalizer.

16. The digital subscriber line communicating system according to claim 3 ~~or 8~~, wherein for watching or re-synchronizing the superframe or the hyperframe synchronization, in the case where the synchronization symbol is detected at the receiving side, the synchronization is checked with detection of the next inverse synchronization symbol, and in the case where the inverse synchronization symbol is detected, on the other hand, the synchronization is checked with the next detected synchronization symbol.

17. A digital subscriber line communicating system for communicating between a transceiver in a central office and a transceiver in a remote terminal through a communication line, wherein, during timing recover training sequence between said central office and said remote terminal, an inside symbol of a downstream sliding

window is formed by a first kind of signal, and an outside symbol of said downstream sliding window is formed by a second kind of signal, said first kind of signal and said second kind of signal being obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting the phase of the output of a fast Fourier transform of said carrier signal, so as to recognize the phase of a timing signal which represents a periodical noise duration.

18. A digital subscriber line communicating system for communicating between a transceiver in a central office and a transceiver in a remote terminal through a communication line, wherein, during timing recover training sequence between said central office and said remote terminal, an inside symbol of a downstream sliding window is formed by a first kind of signal, and an outside symbol of said downstream sliding window is formed by a second kind of signal, said first kind of signal and said second kind of signal being obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting the phase of the output of a quadrature phase shift keying demodulation of said carrier signal, so as to recognize the phase of a timing signal which represents a periodical noise duration.

19. A digital subscriber line communicating system for communicating between a central office and a remote terminal;

said central office comprising;

a phase-locked loop circuit for synchronizing a network timing reference signal, having a frequency higher than the frequency of a first timing signal, with an oscillating signal of a crystal oscillator provided in said central office, to generate a master clock signal; and

a timing signal regenerating circuit for shifting the phase of said first timing signal to provide a synchronization in phase with the phase of said master clock signal so as to generate a second timing signal to be used in said central office.

20. A transceiver to be connected through a communication line, comprising:

a sliding window generating unit for generating a sliding window based on a timing signal representing a periodical noise duration; and

a sliding window transmitting unit for transmitting modulated symbol according to said sliding window through said communication line to said receiving side;

said sliding window generating unit comprising:

a hyperframe counter for periodically counting a predetermined number of continuous transmitting modulated symbols constituting a hyperframe synchronized with said timing signal; and

a decoder for discriminating, based on the count value output from said hyperframe counter, whether a transmitting data symbol belongs to a far end cross-talk duration at said receiving side or a near end cross-talk duration at said receiving side.

21. The transceiver according to claim 20, wherein said hyperframe counter is reset each time when said hyperframe counter counts said predetermined number of continuous transmitting data symbols.

22. The transceiver according to claim 20, further

comprising:

a timing signal generating unit for generating said timing signal synchronized with a periodical noise including said periodical noise duration which interferes with said transmitting data symbol;

a receiver equalizer; and

a sequencer for effecting a transition of the status of initialization of said transceiver during an initialization period before starting usual communication, said initialization period including an activation and acknowledgement sequence, a transceiver training sequence for performing an initial training of said receiver equalizer, a channel analysis sequence for measuring the quality of said communication line, and an exchange sequence for determining the transmitting capacity of said communication line based on the measured quality of said communication line.

23. The transceiver according to claim 22, wherein, said sequencer effects the transition of the status based on the value counted by said hyperframe counter.

24. The transceiver according to claim 22, wherein, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence, said initialization is carried out by transmitting modulated symbols through only the inside of said sliding window.

25. The transceiver according to claim 22, wherein, during said transceiver training sequence said exchange sequence, and said channel analysis sequence except for a quality measuring sequence, said initialization is carried out by transmitting modulated symbols through only the inside of said sliding window, and during said quality measuring sequence in said channel analysis sequence, said initialization is carried out by transmitting modulated symbols through both the inside and the outside of said sliding window.

26. The transceiver according to claim 22, further comprising:

a sequence transition determining unit for making a transition, in synchronization with said timing signal, from said activation and acknowledge sequence to said transceiver training sequence or from said transceiver training sequence to said channel analysis sequence.

27. The transceiver according to claim 22, wherein, said modulated symbols are transmitted from said transmitting side through both the inside and the outside of said sliding window, and said modulated symbols are used for training of said receiver equalizer by said receiving side only when said receiving side is in a far end cross-talk duration.

28. The transceiver according to claim 22, wherein, during the training of said receiver equalizer in said transceiver training sequence, a step size for updating coefficients of said receiver equalizer is made to be zero in said near end cross-talk duration, or to be a value smaller than the value in said far end cross-talk duration in said near end cross-talk duration at said receiving side, so that said transceiver training sequence is carried out continuously in said far end cross-talk duration and said near end cross-talk duration at said receiving side.

29. The transceiver according to claim 22, wherein said receiving side comprises:

a synchronization symbol detecting unit for detecting a synchronization symbol included in each of superframes which constitute said hyperframe;

an inverse synchronization symbol detecting unit for detecting an inverse synchronization symbol included in said hyperframe; and

an inverting unit for rotating the phase of each carrier signal of the detected inverse synchronization symbol, except for the carrier signal of a pilot tone, by substantially 180° to obtain an inverted inverse synchronization symbol having the same phase as

the phase of each of the detected synchronization symbols;

the detected synchronization symbols and the inverted inverse synchronization symbol being used for the training of said receiver equalizer.

30. The transceiver according to claim 22, wherein for watching or re-synchronizing the superframe or the hyperframe synchronization, in the case where the synchronization symbol is detected at the receiving side, the synchronization is checked with detection of the next inverse synchronization symbol, and in the case where the inverse synchronization symbol is detected, on the other hand, the synchronization is checked with the next detected synchronization symbol.

31. A transceiver to be connected through a communication line, wherein, during timing recover training sequence between said central office and said remote terminal, an inside symbol of a downstream sliding window is formed by a first kind of signal, and an outside symbol of said downstream sliding window is formed by a second kind of signal, said first kind of signal and said second kind of signal being obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting the phase of the output of a fast Fourier transform of said carrier signal, so as to recognize the phase of a timing signal which represents a periodical noise duration.

32. A transceiver to be connected through a communication line, wherein, during timing recover training sequence between said central office and said remote terminal, an inside symbol of a downstream sliding window is formed by a first kind of signal, and an

outside symbol of said downstream sliding window is formed by a second kind of signal, said first kind of signal and said second kind of signal being obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting the phase of the output of a quadrature phase shift keying demodulation of said carrier signal, so as to recognize the phase of a timing signal which represents a periodical noise duration.

33. A transceiver in a central office connected through a communication line to a remote terminal, said transceiver comprising;

a phase-locked loop circuit for synchronizing a network timing reference signal, having a frequency higher than the frequency of a first timing signal, with an oscillating signal of a crystal oscillator provided in said central office, to generate a master clock signal; and

a timing signal regenerating circuit for shifting the phase of said first timing signal to provide a synchronization in phase with the phase of said master clock signal so as to generate a second timing signal to be used in said central office.

34. A digital subscriber line communicating system for communicating through a communication line, including:

means for generating a sliding window based on a timing signal representing a periodical noise duration; and

means for discriminating, based on a status of said sliding window, which kind of durations of said periodical noise duration a transmitting data symbol belongs to.

35. A digital subscriber line communicating system for communicating through a communication line, including:

means for generating a sliding window based on a timing signal representing a periodical noise duration;

means for discriminating, based on a status of said sliding window, which kind of durations of said periodical noise duration a transmitting data symbol belongs to; and

means for performing an initial training of a receiver equalizer according to said status of said sliding window.